Claims

1. A method for energy management in a robotic device, the robotic device comprising at least one energy storage unit and a signal detector, the method comprising the steps of:

providing a base station for mating with the robotic device, the base station comprising a plurality of signal emitters including a first signal emitter and a second signal emitter;

determining a quantity of energy stored in the energy storage unit, the quantity characterized at least by a high energy level and a low energy level; and

performing, by the robotic device, a predetermined task based at least in part on the quantity of energy stored.

2. The method of claim 1 wherein the step of determining a quantity of energy stored comprises using coulometry.

3. The method of claim 1 wherein the step of determining a quantity of energy stored comprises setting a time period.

4. The method of claim 1 wherein the step of performing the predetermined task occurs when the quantity of energy stored exceeds the high energy level, the predetermined task comprising movement of the robotic device away from the base station in response to reception, by the signal detector, of a base station avoidance signal.

5. The method of claim 1 further comprising the step of returning the robotic device to the base station in response to reception, by the signal detector, of a base station homing signal.

6. The method of claim 5 wherein the step of returning the robotic device to the base station occurs when the quantity of energy stored is less than the high energy level.

7. The method of claim 5 wherein the step of returning the robotic device to the base station occurs when the quantity of energy stored is less than the low energy level, and wherein the predetermined task comprises a reduction in energy use by the robotic device.

8. The method of claim 7 wherein the predetermined task further comprises altering a travel characteristic of the robotic device.

9. The method of claim 5 further comprising the step of charging the robotic device.

10. The method of claim 9 further comprising the step of resuming the predetermined task.

11. A method of docking a robotic device with a base station comprising a plurality of signal emitters including a first signal emitter and a second signal emitter, the method comprising the steps of:

orienting the robotic device in relation to (i) a first signal transmitted by the first signal emitter and (ii) a second signal transmitted by the second signal emitter; and

maintaining an orientation of the robotic device relative to the first and second signals as the robotic device approaches to the base station.

12. The method of claim 11 further comprising the steps of:

detecting, by the robotic device, an overlap between the first signal and the second signal;

following, by the robotic device, a path defined at least in part by the signal overlap; and

docking the robotic device with the base station.

13. The method of claim 12 wherein the step of following the path defined at least in part by the signal overlap comprises reducing velocity of the robotic device.

14. The method of claim 12 wherein the step of docking the robotic device with the base station comprises:

detecting, by the robotic device, contact with charging terminals on the base station; and

stopping movement of the robotic device.

15. The method of claim 14 further comprising the step of charging the robotic device.

16. The method of claim 15 wherein the step of charging the robotic device comprises a plurality of charging levels.

17. An autonomous system comprising a base station comprising:
charging terminals for contacting an external terminal of a robotic device; and
a first signal emitter and a second signal emitter.

18. The autonomous system of claim 17 wherein the first signal emitter transmits a base station avoidance signal.

19. The autonomous system of claim 17 wherein the second signal emitter transmits a base station homing signal.

20. The autonomous system of claim 19 wherein the homing signal comprises a pair of signals.

21. The autonomous system of claim 20 wherein the pair of signals comprise a first signal and a second different signal.

22. The autonomous system of claim 21 wherein the first signal and the second signal overlap.

23. The autonomous system of claim 17 wherein the first signal emitter and the second signal emitter transmit at least one optical signal.

24. The autonomous system of claim 17 further comprising a robotic device for performing a predetermined task, the robotic device comprising:

at least one energy storage unit with external terminals for contacting the charging terminals; and

at least one signal detector.

25. The autonomous system of claim 24 wherein the at least one signal detector is adapted to detect at least one optical signal.

26. A method of charging a battery of a device, the method comprising the steps of:

providing low energy to charging terminals of a charger;

detecting presence of the device by monitoring at least one of a predetermined change in and a predetermined magnitude of a parameter associated with the charger; and

increasing energy to the charging terminals to charge the battery.

27. The method according to claim 26, further comprising the steps of:

determining a level of charge in the device; and

permitting charging of the battery in the device when the level of charge is below a predetermined threshold.

28. A system for charging a mobile device, the system comprising:

a stationary charger comprising a plurality of first charging terminals;

circuitry for detecting presence of the device by monitoring at least one of a predetermined change in and a predetermined magnitude of a parameter associated with the charger; and

a mobile device comprising:

a battery; and

a plurality of second charging terminals adapted to mate with first charging terminals.

29. The system of claim 28, wherein the circuitry determines a level of charge in the battery and controls an power level provided to the first charging terminals.

30. The system of claim 29 wherein the circuitry increases the power level provided to the first charging terminals upon measuring a predetermined voltage across the first charging terminals when mated with the second charging terminal.